REMARKS

Applicants respectfully request consideration of the subject application as amended herein. This Amendment is submitted in response to an Office Action mailed on July 19, 2000. In this Amendment, claims 1, 2, 9, 11-14, 17-19, and 21-31 have been amended.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 1, 8, 11-12, 13, and 30

Claims 1, 8, 11-12, 13, and 30 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 8, 11-12, 13, and 30 have been amended to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Specifically, in claim 1, the term "pre-existing document hierarchy" has been replaced with the term "pre-existing directory structure" to clarify that although the document is placed in a newly created document hierarchy (a mirror document hierarchy), this document hierarchy has a directory structure of the original document hierarchy.

Claims 8, 11, 12 and 30 have been amended to correct inaccuracies rending these claims indefinite.

In claim 13, the language pertaining to determining "an organization in the pre-existing document directory structure" has been replaced with the language "to determine a document classification profile of the pre-existing document directory structure." The determination of the document classification profile is needed to analyze the manner followed by the user when manually selecting directories for new documents.

Applicant respectfully submits that claims 1, 8, 11-12, 13, and 30, as amended, satisfy the requirements of 35 U.S.C § 112, second paragraph and respectfully requests the withdrawal of the rejection of the claims under § 112.

Rejections under 35 U.S.C. § 103

Claims 1-28

Claims 1-4, 7, 9-10 and 13-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takano (U.S. Patent No. 5,983,246) in view of de Souza, et al. (U.S. Patent No. 5,848,418). Claims 5 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takano (U.S. Patent No. 5,983,246) and de Souza, et al. (U.S. Patent No. 5,848,418) in view of Iijima (U.S. Patent No. 5,845,304). Claims 6 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takano (U.S. Patent No. 5,983,246) and de Souza, et al. (U.S. Patent No. 5,848,418) as applied to claims 1 above, and further in view of Ho, et al. (Decision Combination in Multiple Classifier Systems). As fully described below, claims 1-28 as amended are patentable over the above references.

Takano discloses a document classifying system for classifying documents distributed and existent in a network environment. In the system of Takano, a service provider manually registers documents in a database and determines classifications to which the documents should belong. Then, bibliographic items contained in the classified documents are used to calculate a distinction quantity for each resulting classification item. Further, when a document is classified by the system, a distinction quantity of the document is calculated prior to classification by the system based on the bibliographic item included in this document. The calculations for this document and for existing classification items are then used to determine a classification item to which the document should belong.

Contrary to the present invention as claimed, the system of Takano cannot classify previously unclassified documents, as does the present invention. Even the documents referred to in Takano as "unclassified documents" have been previously classified as indicated by the fact that each document entering the Takano system has an associated bibliographic item prepared by the service provider in advance (i.e., before, the documents are classified by the Takano system) (col. 6, lines 48-51). Takano then classifies the documents based on their bibliographic items. Each bibliographic item constitutes a "characteristic feature of the content of the document," i.e., a set of keywords and their frequency of appearance in the document (col. 8, lines 51-67).

Specifically, the Takano classification system provides for manual classification of documents and then automatically classifies

> the remaining documents which have not been manually classified. Of these sections, the classification distinction calculation section 13 consults the bibliographic item of the document classified to each classification item in the database section 12 to calculate a distinction quantity of each classification item. Further, the document distinction calculation section 14 calculates a distinction quantity of the unclassified document in the database 12 based on its bibliographic item. Furthermore, the classification decision section 15 decides the classification item to which the unclassified document should belong based on the distinction quantity calculated by the document distinction calculation section 14 and the distinction quantity of each classification item calculated by the classification distinction section 13 so that the unclassified document be classified and registered. (Emphasis added) (col. 6, lines 23-49).

The present invention, in contrast, classifies a previously unclassified electronic document by analyzing text and image data of the entire document. In addition, the present invention not only classifies the documents but also places them in the directory structure defined by the user, thereby relieving the user of the duty of manually selecting a directory for the new document. Takano lacks this limitation of the present invention. Thus, Takano does not teach or suggest at least the above pertinent features of the present invention as claimed in claims 1-28.

De Souza, Iijima and Ho do not help Takano as none of them teach or suggest classifying new electronic documents that have not been previously classified and automatically placing these documents in the directory structure defined by the user. Accordingly, the above references either alone or in combination do not teach each and every element of the invention as claimed in claims 1-28. Therefore, the combination cannot render obvious Applicants' invention as claimed in claims 1-28, and Applicants respectfully request the withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) over the combination.

Claims 29-32

Claims 29-32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mahoney (U.S. Patent No. 5,889, 886). As fully described below, claims 29-32 as amended are patentable over Mahoney.

Mahoney discloses a method and apparatus for analyzing image data. Specifically, Mahoney analyzes image data representing images containing text to

partition the image into running and non-running text regions. Running text is text which comprises the body matter of a document. Non-running text is text which is not port of the body matter and includes tables, headings, captions, etc. Based on the analysis, the characteristics of running text regions are utilized to identify such regions and to subsequently group all non-running text regions into related groups.
Although Mahoney performs the analysis of documents, this analysis provides information about the layout structure of the document rather than its content. The present invention, in contrast, analyzes the content of the document and selects an appropriate directory for placing this document based on the analysis of the document content. Mahoney neither analyzes the content of the document nor determines a directory in a document directory structure for storing the document in accordance with the document's content. Thus, Mahoney lacks at least these pertinent limitations claimed in claims 29-32 of the present invention. Accordingly, Applicants respectfully submit that Applicants' invention as claimed in claims 29-32 is not rendered obvious by Mahoney, and respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a).

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims are in condition for allowance. Applicants respectfully request reconsideration of the application and allowance of the pending claims.

If the Examiner determines the prompt allowance of these claims could be facilitated by a telephone conference, the Examiner is invited to contact Marina Portnova at (408) 720-8300.

Deposit Account Authorization

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due. Furthermore, if an extension is required, then Applicant hereby requests such extension.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: December 19, 2000

M. Portnova

Marina Portnova
Attorney for Applicant
Registration No. 45,750

Customer No. 008791
12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8598

VERSION OF CLAIMS WITH MARKINGS:

1. (Amended) A method for document classification comprising:

analyzing textual and graphical properties of [an] a previously unclassified electronic document using text data and image data of the entire electronic document;

generating a classification of the document based on the textual and graphical properties; and

storing the electronic document in a pre-existing [document hierarchy] directory structure based on the classification.

2. (Amended) The method defined in Claim 1 where the [document hierarchy] directory structure comprises a hierarchy of documents mirroring in a similar fashion an organization in a pre-existing memory storing documents.

9. (Amended) A software product including a machine-readable medium having stored thereon sequences of instructions, which, when executed by a processor, cause the processor to:

analyze textual and graphical properties of [an] a previously unclassified electronic document using text data and image data of the entire electronic document;

generate a classification of the document based on the textual and graphical properties; and

store the electronic document in a pre-existing directory structure based on the classification.

11. (Amended) The machine-readable medium of claim [5] 9, wherein the sequences of instructions that cause the processor to analyze graphical properties of an electronic document further comprise sequences of instructions that cause the processor to:

determine a point set corresponding to the electronic document, wherein points of the point set correspond to end points of lines;

determine a density of points within the point set;

generate a document profile based, at least in part, on the density of points within the point set.

12. (Amended) The machine-readable medium of claim [5] 9, wherein the sequences of instructions that cause the processor to generate a classification of the document based on the textual and graphical properties further comprises sequences of instructions that cause the processor to combine results from the textual and graphical analysis using a Borda Count.

13. (Amended) A method for document classification comprising:

analyzing documents in a pre-existing document directory structure to determine [an organization] a document classification profile of [in] the pre-existing document directory structure;

generating a mirror directory structure based on the pre-existing document directory structure;

receiving a previously unclassified electronic document;

analyzing textual and graphical properties of the electronic document using text data and image data of the entire electronic document; and

placing [a] the electronic document in the mirror directory structure based on the [organization] document classification profile of the pre-existing document directory structure, results of textual analysis of the document, and results of graphical analysis of the document.

14. (Amended) The method of claim 13, wherein analyzing the pre-existing document directory structure [to determine the organization] further comprises:

recursively descending the pre-existing document directory structure;

generating a list of directories in the pre-existing document directory structure;

examining files in directories of the pre-existing document directory structure to determine content; and

examining the content of the files to determine [the organization] document classification profile of the directories in the pre-existing document directory structure.

17. (Amended) The method of claim 13 wherein placing [a] the electronic document in the mirror directory structure [based on the organization of the pre-existing document directory structure] comprises:

determining a primary directory in the pre-existing document directory structure in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

storing the document in a primary corresponding directory in the mirror directory structure that corresponds to the primary directory in the pre-existing document directory structure.

18. (Amended) The method of claim 17 further comprising:

determining a secondary directory in the pre-existing document directory in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

storing the document in a corresponding secondary directory in the mirror directory structure that corresponds to the secondary directory in the pre-existing document directory structure.

19. (Amended) A computer-readable medium having stored thereon sequences of instructions which, when executed by a processor, cause the processor to:

analyze a pre-existing document directory structure to determine [an organization] a document classification profile of the pre-existing document directory structure;

generate a mirror directory structure based on the pre-existing document directory structure;

receive a previously unclassified electronic document;

analyze textual and graphical properties of the electronic document using text data and image data of the entire electronic document; and

place [a] the electronic document in the mirror directory structure based on the [organization] document classification profile of the pre-existing document directory structure.

21. (Amended) The computer-readable medium of claim 19, wherein the sequences of instructions that cause the processor to generate a mirror directory structure [based on the pre-existing document directory structure] further comprise sequences of instructions that cause the processor to generate a document directory structure having a set of directories and relationships equivalent to the pre-existing document directory structure.

22. (Amended) The computer-readable medium of claim 19, wherein the sequences of instructions that cause the processor to place a document in the mirror directory structure [based on the organization of the pre-existing document directory structure] further comprise sequences of instructions that cause the processor to:

determine a primary directory in the pre-existing document directory structure in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

store the document in a primary corresponding directory in the mirror directory structure that corresponds to the primary directory in the pre-existing document directory structure.

23. (Amended) The computer-readable medium of claim 22 further comprising sequences of instructions that cause the processor to:

determine a secondary directory in the pre-existing document directory in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

store the document in a corresponding secondary directory in the mirror directory structure that corresponds to the secondary directory in the pre-existing document directory structure.

24. (Amended) An apparatus comprising:

means for analyzing a pre-existing document directory structure to determine [an organization] document classification profile of the pre-existing document directory structure;

means for generating a mirror directory structure based on the pre-existing document directory structure;

means for receiving a previously unclassified electronic;

means for analyzing textual and graphical properties of the electronic document using text data and image data of the entire electronic document; and

means for placing [a] the electronic document in the mirror directory structure based on the [organization] document classification profile of the pre-existing document directory structure.

25. (Amended) The apparatus of claim 24, wherein means for analyzing the pre-existing document directory structure [to determine the organization] further comprises:

means for recursively descending the pre-existing document directory structure;

means for generating a list of directories in the pre-existing document directory structure;

means for examining files in directories of the pre-existing document directory structure to determine content; and

means for examining the content of the files to determine [the organization] document classification profile of the directories in the pre-existing document directory structure.

26. (Amended) The apparatus of claim 24, wherein means for generating a mirror directory structure [based on the pre-existing document directory structure] comprises means for generating a document directory structure having a set of directories and relationships equivalent to the pre-existing document directory structure.

27. (Amended) The apparatus of claim 24, wherein means for placing a document in the mirror directory structure [based on the organization of the pre-existing document directory structure] comprises:

means for determining a primary directory in the pre-existing document directory structure in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

means for storing the document in a primary corresponding directory in the mirror directory structure that corresponds to the primary directory in the pre-existing document directory structure.

28. (Amended) The apparatus of claim 27 further comprising:

means for determining a secondary directory in the pre-existing document directory in which the document should be placed based on the [organization] document classification profile of the pre-existing document directory structure; and

means for storing the document in a corresponding secondary directory in the mirror directory structure that corresponds to the secondary directory in the pre-existing document directory structure.

29. (Amended) A document processing system comprising:

a document scanning device;

a document storage device coupled to the document scanning device, wherein the document storage device is organized as a document directory structure having multiple directories, and further wherein the document storage device has a mirror directory structure having multiple directories organized based on the document directory structure; and

a processor coupled to the document scanning device and to the document storage device, wherein the processor analyzes content of a document scanned by the document scanning device to determine a directory in the document directory structure in which the document should be placed and stores the document in a corresponding directory in the mirror directory structure.

30. (Amended) The document processing system of claim 29 wherein the processor is operable to determine [determines] a secondary [director] directory in the document directory structure in which the document should be placed and [stored] to

store the document [is] in a corresponding secondary directory in the mirror directory structure.

31. (Amended) The document processing system of claim 29 wherein the processor analyzes files stored in the document directory structure to determine content and generates [an organizational description] a document classification profile of the document directory structure based on the analysis